CHICOT EQUIVALENT AQUIFER SYSTEM SUMMARY

BASELINE MONITORING PROGRAM, FY 2006

APPENDIX 12

OF THE

TRIENNIAL SUMMARY REPORT

FOR THE

WATER QUALITY ASSESSMENT DIVISION

OF

LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY

PARTIAL FUNDING PROVIDED THROUGH THE CWA

CHICOT EQUIVALENT AQUIFER SYSTEM SUMMARY
TABLE OF CONTENTS

BACKGROUND

In order to better assess the water quality of a particular aquifer at a given point in time, an attempt was made during the year to sample all Baseline Monitoring Program, or BMP, wells producing from a common aquifer in a narrow time frame. Also, to more conveniently and economically promulgate those data collected from a particular aquifer, a summary report on each aquifer sampled was prepared separately. Collectively, these aquifer summaries will make up part of the Baseline Monitoring Program Triennial Summary Report.

Figure 12-1 shows the geographic locations of the Chicot Equivalent aquifer system and the associated wells, whereas Table 12-2 lists the wells in the aquifer along with their total depths and the use made of produced waters and date sampled.

From August of 2005 to January of 2006, twenty-five (25) wells were sampled which produce from the Chicot Equivalent aquifer system. Ten of the wells are classified as industrial, eight are domestic, and five are public supply wells. Also, one is classified as an irrigation well and one is classified as a monitoring well. The wells are located in twelve parishes in southeast Louisiana.

Well data and aquifer assignment for registered water wells were obtained from the Louisiana Department of Transportation and Development's Water Well Registration Data file.

GEOLOGY

The Chicot Equivalent aquifer system is composed of the Pleistocene aged aquifers of the New Orleans area, the Baton Rouge area, and St. Tammany, Tangipahoa, and Washington Parishes. The aquifers are in Pleistocene aged alluvial and terrace deposits. The sedimentary sequences that make up the aquifer system are subdivided into several aquifer units separated by confining beds. Northward within southeast Louisiana, fewer units are recognized because some younger units pinch out updip and some clay layers present to the south disappear. Where clay layers are discontinuous or disappear, aquifer units coalesce. The aquifers are moderately well, to well sorted, and consist of fine sand near the top, grading to coarse sand and gravel in lower parts and are generally confined by silt and clay layers.

HYDROGEOLOGY

The deposits that constitute the individual aquifers are not readily differentiated at the surface and act as one hydraulic system that can be subdivided into several hydrologic zones in the subsurface. The Mississippi River Valley is entrenched into the Pleistocene strata in the western part of the system, resulting in water movement between the river, the shallow sands, and the Pleistocene aquifers. Recharge occurs primarily by the direct infiltration of rainfall in interstream, upland outcrop areas, by the movement of water between aquifers, and between the aquifers and the Mississippi River. The hydraulic conductivity varies between 10-200 feet/day.

The maximum depths of occurrence of freshwater in the Chicot Equivalent range from 350 feet above sea level, to 1,100 feet below sea level. The range of thickness of the fresh water interval in the Chicot Equivalent is 50 to 1,100 feet. The depths of the Chicot Equivalent wells that were monitored in conjunction with the BMP range from 90 to 807 feet.

INTERPRETATION OF DATA

FIELD, WATER QUALITY, AND NUTRIENTS PARAMETERS

Table 12-3 lists the field parameters that are checked and the water quality and nutrients parameters for which samples were collected at each well. It also shows the field results and the water quality and nutrients analytical results for each well. Table 12-5 lists the minimum, maximum, and average results for the field data, water quality data, and nutrients data for the Chicot Equivalent aquifer system.

Federal Primary Drinking Water Standards

Under the Federal Safe Drinking Water Act, EPA has established maximum contaminant levels (MCLs) for pollutants that may pose a health risk in public drinking water. An MCL is the highest level of a contaminant that EPA allows in public drinking water. MCLs ensure that drinking water does not pose either a short-term or long-term health risk. While not all wells sampled were public supply wells, this Office does use the MCLs as a benchmark for further evaluation.

A review of the analyses listed on Table 12-3 shows that no primary MCL was exceeded for field, water quality, or nutrients parameters.

Federal Secondary Drinking Water Standards

EPA has set secondary standards that are defined as non-enforceable taste, odor, or appearance guidelines.

Field and laboratory data contained in Table 12-3 show that the following secondary MCLs (SMCLs) were exceeded.

pH – SMCL = 6.5 – 8.5 SU
AN-6297Z – 9.35 SU
EB-1231 – 6.38 SU, duplicate – 6.38 SU
EF-5329Z – 5.76 SU
SH-5333Z – 5.88 SU
SH-77 – 5.72 SU, duplicate – 5.72 SU
ST-5245Z – 5.64 SU
TA-520 – 4.96 SU
WA-5295Z – 5.84 SU
WA-5311Z – 5.12 SU

Chloride – SMCL = 250 ppm
AN-6297Z – 671 ppm
JF-28 – 290 ppm, duplicate – 285 ppm
SC-179 – 305 ppm, duplicate – 300 ppm
SJB-173 – 279 ppm

Color – SMCL = 15 PCU
JF-28 – 130 PCU, duplicate – 130 PCU
SC-179 – 55 PCU, duplicate – 55 PCU
SJB-173 – 20 PCU

TDS – SMCL = 500 ppm
AN-316 – 522 ppm, duplicate – 534 ppm
AN-6297Z – 1,302 ppm
JF-28 – 934 ppm, duplicate – 914 ppm
SC-179 – 1,010 ppm, duplicate – 1,012
SJB-173 – 914 ppm

Comparison To Historical Data

Table 12-7 lists the current field, water quality, and nutrients data averages alongside those parameters' data averages for the three previous sampling rotations (three, six and nine years prior). A comparison shows that the averages have remained very consistent with only slight fluctuations.

INORGANIC PARAMETERS

Table 12-4 shows the inorganic (total metals) parameters for which samples were collected and the analytical results for those parameters for each well. Table 12-6 lists the minimum, maximum, and average results for the inorganic data for the Chicot Equivalent aquifer system.

The "Rejected" selenium and thallium data in Table 12-4 was determined to be invalid due to selenium and thallium being detected in the corresponding laboratory method blanks. The reported values of selenium and thallium in the method blanks were nearly identical to those reported for the well samples in question. Therefore, the detections of these inorganics were determined to be due to laboratory contamination, and were rejected.

Federal Primary Drinking Water Standards

A review of the analyses listed on Table 12-4 shows that no Primary Drinking Water Standard (MCL) was exceeded for inorganic parameters.

Federal Secondary Drinking Water Standards

Laboratory data contained in Table 12-4 show that the following secondary SMCL was exceeded.

Iron – SMCL = 300 ppb
AN-296 – 350 ppb
EB-34 – 2,650 ppb
SJ-226 – 3,610 ppb
ST-11516Z – 594 ppb
AN-6297Z – 10,200 ppb
SH-77 – 505 ppb, duplicate – 262 ppb
SJB-173 – 600 ppb
ST-5245Z – 4,520 ppb

Comparison To Historical Data

Table 12-8 lists the current inorganic data averages alongside the inorganic data averages for the three previous sampling rotations (three, six and nine years prior). A comparison shows that iron has steadily increased; copper has decreased to below its detection limit; and barium and zinc have fluctuated. All other averages have remained consistent.

VOLATILE ORGANIC COMPOUNDS

Table 12-9 shows the volatile organic compound (VOC) parameters for which samples were collected. Due to the large number of analytes in this category, a total list of the analytical results for each analyte is not provided, however any detection of a VOC would be discussed in this section.

Chloroform, a common laboratory contaminant was detected at very low levels in well EB-34, an industrial well. Chloroform was detected at a concentration of 2.3 parts per billion (ppb), the laboratory detection limit for this compound is 2 ppb and there is no MCL established for chloroform. There were no other confirmed detections of VOCs during the FY 2006 sampling of the Chicot Equivalent aquifer system.

SEMIVOLATILE ORGANIC COMPOUNDS

Table 12-10 shows the semi-volatile organic compound parameters for which samples were collected. Due to the large number of analytes in this category, a total list of the analytical results for each analyte is not provided, however any detection of a semi-volatile would be discussed in this section.

There were no confirmed detections of a semi-volatile organic compound during the FY 2006 sampling of the Chicot Equivalent aquifer system.

PESTICIDES AND PCBS

Table 12-11 shows the pesticide and PCB parameters for which samples were collected. Due to the large number of analytes in this category, a total list of the analytical results for each analyte is not provided, however any detection of a pesticide or PCB would be discussed in this section.

There were no confirmed detections of a pesticide or PCB during the FY 2006 sampling of the Chicot Equivalent aquifer system.

COMMON WATER CHARACTERISTICS

Table 12-1 below highlights some of the more common water characteristics that are considered when studying ground water quality. The minimum, maximum, and average values that were found during the current sampling of the Chicot Equivalent aquifer system for pH, TDS, hardness, chloride, iron, and nitrite-nitrate are listed in the table. Figures 12-2, 12-3, 12-4, and 12-5 respectively, represent the contoured data for pH, TDS, chloride, and iron. The data values that are contoured and reported in the contour maps are derived from the initial current sampling of each well with any duplicate samples or resamples averaged into them. The data average for hardness shows that the ground water produced from this aquifer is soft[1].

Table 12-1 Common Water Characteristics
Fiscal Year 2006

PARAMETER	MINIMUM	MAXIMUM	AVERAGE
PH (SU)	4.96	9.35	7.16
TDS (ppm)	27.3	1,302	372.2
Hardness (ppm)	<5	168	44.6
Chloride (ppm)	2.6	671	104.1
Iron (ppb)	<20	10,200	848.6
Nitrite-Nitrate (ppm)	<0.05	2.18	0.16

[1] Classification based on hardness scale from: *Peavy, H.S. et al. Environmental Engineering, 1985.*

SUMMARY AND RECOMMENDATIONS

In summary, the data show that the ground water produced from the Chicot Equivalent aquifer system is soft and that no primary MCL was exceeded. This aquifer is of fair quality when considering taste, odor, or appearance guidelines. Furthermore, based on a comparison of historical BMP data averages, the characteristics of the water produced from the Chicot Equivalent Aquifer System has not changed

In previous sampling of this aquifer several wells exhibited levels of arsenic and mercury, but for the FY 2006 sampling neither of these were detected in any well sampled. Additionally, 1,2-Dichloroethane was detected in well EB-34 in the FY 2003 monitoring at just less than 30 ppb, whereas the FY 2006 results was non detect for 1,2-Dichloroethane. Chloroform, a volatile organic compound which has no drinking water standard established, was detected at 2.3 ppb in the current sampling of this aquifer system. There were no other confirmed detections of a VOC, SVOC, Pesticide or PCB for the FY 2006 monitoring period.

Also a comparison of present and historical BMP data averages show that turbidity, barium and zinc have fluctuated, iron has steadily increased, and that copper has decreased to below its detection limit. All other data averages have remained very consistent.

It is recommended that the Project wells assigned to the Chicot Equivalent aquifer system be re-sampled as planned in approximately three years. In addition, several wells should be added to those currently in place to increase the well density for this aquifer.

Table 12-2 List of Wells Sampled

DOTD WELL NUMBER	PARISH	DATE SAMPLED	OWNER	DEPTH (FEET)	WELL USE
AN-266	ASCENSION	8/2/2005	CITY OF GONZALES	548	PUBLIC SUPPLY
AN-296	ASCENSION	8/23/2005	UNIROYAL CHEMICAL CO.	300	INDUSTRIAL
AN-316	ASCENSION	8/23/2005	GEISMAR VINYLS	478	INDUSTRIAL
AN-321	ASCENSION	8/22/2005	RUBICON, INC.	523	INDUSTRIAL
AN-337	ASCENSION	8/22/2005	BASF CORP.	459	PUBLIC SUPPLY
AN-500	ASCENSION	8/23/2005	UNIROYAL CHEMICAL CO.	480	INDUSTRIAL
AN-6297Z	ASCENSION	8/22/2005	VULCAN CHEMICAL	294	MONITOR
AN-9183Z	ASCENSION	8/2/2005	PRIVATE OWNER	630	DOMESTIC
EB-1231	E BATON ROUGE	8/1/2005	GEORGIA PACIFIC CORP.	280	INDUSTRIAL
EB-34	E BATON ROUGE	8/1/2005	EXXONMOBIL USA	453	INDUSTRIAL
EB-991B	E BATON ROUGE	8/1/2005	BATON ROUGE WATER WORKS	565	PUBLIC SUPPLY
EF-5329Z	E FELICIANA	8/1/2005	PRIVATE OWNER	97	DOMESTIC
JF-28	JEFFERSON	11/28/2005	ENTERGY	807	INDUSTRIAL
LI-5477Z	LIVINGSTON	8/2/2005	PRIVATE OWNER	106	DOMESTIC
LI-85	LIVINGSTON	8/2/2005	FRENCH SETTLEMENT WATER SYS	405	PUBLIC SUPPLY
SC-179	ST CHARLES	11/15/2005	UNION CARBIDE	460	INDUSTRIAL
SH-5333Z	ST HELENA	1/9/2006	PRIVATE OWNER	230	DOMESTIC
SH-77	ST HELENA	1/9/2006	TRANSCO	170	PUBLIC SUPPLY
SJ-226	ST JAMES	11/29/2005	GRAMERCY ALUMINA, LLC	248	INDUSTRIAL
SJB-173	ST JOHN THE BAPTIST	11/29/2005	E.I. DUPONT	425	INDUSTRIAL
ST-11516Z	ST TAMMANY	1/10/2006	PRIVATE OWNER	340	DOMESTIC
ST-5245Z	ST TAMMANY	1/9/2006	PRIVATE OWNER	90	DOMESTIC
TA-520	TANGIPAHOA	1/9/2006	PRIVATE OWNER	135	IRRIGATION
WA-5295Z	WASHINGTON	1/10/2006	PRIVATE OWNER	100	DOMESTIC
WA-5311Z	WASHINGTON	1/10/2006	PRIVATE OWNER	90	DOMESTIC

Table 12-3 Summary of Water Quality Data

Well Name	pH SU	Sal. ppt	Sp. Cond. mmhos/cm	TDS g/L	Temp. Deg. C	Alk. ppm	NH3 ppm	Cl ppm	Color PCU	Hard. ppm	Nitrite-Nitrate (as N) ppm	TKN ppm	Tot. P ppm	Sp. Cond. umhos/cm	SO4 ppm	TDS ppm	TSS ppm	Turb. NTU
	LABORATORY DETECTION LIMITS →					2.0	0.1	1.3	5.0	5.0	0.05	0.1	0.05	10	1.3/1.25	4.0	4.0	1.0
	FIELD PARAMETERS					LABORATORY PARAMETERS												
AN-266	8.06	0.15	0.31	0.20	24.15	146	0.34	12.4	<5	41	<0.05	0.44	0.21	320	3.8	237	<4	<1
AN-296	8.17	0.20	0.42	0.27	25.65	148	0.45	50.4	10	25.6	<0.05	0.78	0.3	445	2.1	280	<4	<1
AN-316	8.11	0.44	0.89	0.58	24.16	151	0.53	197	10	71	<0.05	0.53	0.16	929	<1.25	522	<4	<1
AN-316*	8.11	0.44	0.89	0.58	24.16	152	0.46	195	10	68.4	<0.05	0.42	0.16	938	<1.25	534	<4	<1
AN-321	8.02	0.37	0.76	0.49	23.19	158	0.5	155	10	28.1	<0.05	0.55	0.31	789	<1.3	466	<4	<1
AN-337	8.25	0.18	0.38	0.24	23.59	171	0.79	24.6	11	22.5	<0.05	0.84	0.26	389	<1.3	265	<4	<1
AN-500	7.75	0.23	0.48	0.31	28.12	154	0.37	58.5	10	42.3	0.23	0.37	0.26	487	2	298	<4	<1
AN-6297Z	9.35	1.20	2.31	1.50	22.69	141	2.2	671	<5	74.8	<0.05	2.22	0.1	2,430	<1.25	1,302	23	38
AN-9183Z	8.25	0.19	0.39	0.25	24.29	168	0.19	26.4	<5	<5	<0.05	0.27	0.16	407	2.8	270	<4	<1
EB-1231	6.38	0.11	0.23	0.15	21.12	65.1	<0.1	30.1	15	62.1	<0.05	<0.1	<0.05	236	3.7	159	<4	<1
EB-1231*	6.38	0.11	0.23	0.15	21.12	64.6	<0.1	30.1	15	61.4	<0.05	<0.1	<0.05	236	3.7	150	<4	<1
EB-34	DATA NOT COLLECTED					161	0.31	6.5	<5	40.5	<0.05	0.44	0.17	317	<1.3	240	<4	3
EB-991B	7.70	0.12	0.26	0.17	22.71	126	0.25	2.7	15	11.3	<0.05	0.39	0.11	259	9.5	194	<4	<1
EF-5329Z	5.76	0.02	0.04	0.02	20.66	10.1	<0.1	2.6	<5	9.5	0.25	<0.1	<0.05	41.3	2.2	39.3	<4	<1
JF-28	7.80	0.82	1.62	1.05	24.59	364	1.3	290	130	33.8	<0.05	1.32	0.59	1,620	<1.3	934	<4	<1
JF-28*	7.80	0.82	1.62	1.05	24.59	363	1.23	285	130	33.6	<0.05	1.27	0.62	1,623	<1.3	914	<4	<1
LI-5477Z	7.87	0.19	0.39	0.25	21.25	209	0.41	7.4	<5	52.5	<0.05	0.85	0.21	406	<1.3	247	<4	<1
LI-85	8.14	0.30	0.61	0.39	23.54	136	0.33	104	<5	69.6	<0.05	0.57	0.13	616	3.2	364	<4	<1
SC-179	DATA NOT COLLECTED					439	2.18	305	55	68	<0.05	2.41	0.51	1,800	<1.3	1,010	<4	<1
SC-179*						439	2.27	300	55	68.6	<0.05	2.32	0.53	1,801	<1.3	1,012	<4	<1
SH-5333Z	5.88	0.03	0.068	0.04	20.02	20.9	<0.1	6.4	<5	12.6	<0.05	<0.1	<0.05	63.7	<1.3	49.3	<4	<1
SH-77	5.72	0.01	0.035	0.02	20.49	10	<0.1	2.8	<5	9.3	0.28	0.11	<0.05	33.2	<1.3	27.3	<4	5
SH-77*	5.72	0.01	0.035	0.02	20.49	8.5	<0.1	2.8	<5	*8.5	0.28	<0.1	<0.05	29.7	<1.3	28	<4	<1
SJ-226	7.45	0.29	0.6	0.39	19.37	181	0.96	56.4	12.5	163	<0.05	1.08	0.58	593	31	340	5	3.3
SJB-173	7.51	0.79	1.57	1.02	21.18	388	1.55	279	20	168	<0.05	1.5	0.27	1,649	<1.25	914	<4	<1
ST-11516Z	7.63	0.14	0.295	0.19	22.01	143	0.27	8.2	5	21	<0.05	0.27	0.36	293	2.8	210	<4	<1

Well Name	pH SU	Sal. ppt	Sp. Cond. mmhos/cm	TDS g/L	Temp. Deg. C	Alk. ppm	NH3 ppm	Cl ppm	Color PCU	Hard. ppm	Nitrite-Nitrate (as N) ppm	TKN ppm	Tot. P ppm	Sp. Cond. umhos/cm	SO4 ppm	TDS ppm	TSS ppm	Turb. NTU
	LABORATORY DETECTION LIMITS →					2.0	0.1	1.3	5.0	5.0	0.05	0.1	0.05	10	1.3/1.25	4.0	4.0	1.0
	FIELD PARAMETERS					LABORATORY PARAMETERS												
ST-5245Z	5.64	0.02	0.051	0.03	19.98	13.7	0.12	4.4	10	16.9	0.42	0.4	<0.05	48.1	1.7	33.3	<4	2.6
TA-520	4.96	0.02	0.048	0.03	20.64	<2	<0.1	4.3	<5	7.5	2.18	<0.1	<0.05	42.9	6.9	34	<4	<1
WA-5295Z	5.84	0.01	0.034	0.02	21.53	9.5	<0.1	2.7	<5	7	<0.05	0.17	<0.05	31.3	<1.3	58	<4	<1
WA-5311Z	5.12	0.01	0.029	0.02	19.62	<2	<0.1	3.3	<5	<5	0.58	0.15	<0.05	23.4	2.1	38.7	<4	<1

* Denotes Duplicate Sample

Table 12-4 Summary of Inorganic Data

WELL NAME	Antimony ppb	Arsenic ppb	Barium ppb	Beryllium ppb	Cadmium ppb	Chromium ppb	Copper ppb	Iron ppb	Lead ppb	Mercury ppb	Nickel ppb	Selenium ppb	Silver ppb	Thallium ppb	Zinc ppb
Laboratory Detection Limits	10	10	1	1	1	5	10	20	10	0.05	5	5	10	5	20
AN-266	<10	<10	108	<1	<1	<5	<10	158	<10	<0.05	<5	<5	<10	<5	<20
AN-296	<10	<10	101	<1	<1	<5	<10	350	<10	<0.05	<5	<5	<10	<5	36.7
AN-316	<10	<10	367	<1	<1	<5	<10	210	<10	<0.05	<5	<5	<10	<5	<20
AN-316*	<10	<10	362	<1	<1	<5	<10	211	<10	<0.05	<5	<5	<10	<5	<20
AN-321	<10	<10	139	<1	<1	<5	<10	219	<10	<0.05	<5	<5	<10	<5	20.3
AN-337	<10	<10	57.9	<1	<1	<5	<10	59.6	<10	<0.05	<5	<5	<10	<5	25.2
AN-500	<10	<10	148	<1	<1	<5	<10	112	<10	<0.05	<5	<5	<10	<5	296
AN-6297Z	<10	<10	249	<1	<1	<5	<10	10,200	<10	<0.05	<5	<5	<10	<5	<20
AN-9183Z	<10	<10	28.3	<1	<1	<5	<10	<20	<10	<0.05	<5	<5	<10	BR	<20
EB-1231	<10	<10	135	<1	<1	<5	<10	93.5	<10	<0.05	<5	<5	<10	BR	<20
EB-1231*	<10	<10	133	<1	<1	<5	<10	71.3	<10	<0.05	<5	<5	<10	<5	<20
EB-34	<10	<10	132	<1	<1	<5	<10	2,650	<10	<0.05	<5	<5	<10	<5	<20
EB-991B	<10	<10	23.1	<1	<1	<5	<10	149	<10	<0.05	<5	<5	<10	BR	<20
EF-5329Z	<10	<10	13.7	<1	<1	<5	<10	<20	<10	<0.05	<5	<5	<10	BR	<20
JF-28	<10	<10	181	<1	<1	<5	<10	93.3	<10	<0.05	<5	<5	<10	<5	<20
JF-28*	<10	<10	181	<1	<1	<5	<10	92.9	<10	<0.05	<5	<5	<10	<5	<20
LI-5477Z	<10	<10	95.2	<1	<1	<5	<10	29.8	<10	<0.05	<5	<5	<10	<5	<20
LI-85	<10	<10	202	<1	<1	<5	<10	79.4	<10	<0.05	<5	<5	<10	<5	<20
SC-179	<10	<10	101	<1	<1	<5	<10	259	<10	<0.05	<5	BR	<10	<5	<20
SC-179*	<10	<10	98.9	<1	<1	<5	<10	249	<10	<0.05	<5	BR	<10	<5	<20
SH-5333Z	<10	<10	73.5	<1	<1	<5	46.4	31.8	<10	<0.05	<5	BR	<10	BR	<20
SH-77	<10	<10	21.2	<1	<1	<5	<10	505	<10	<0.05	<5	BR	<10	BR	<20
SH-77*	<10	<10	21.1	<1	<1	<5	<10	262	<10	<0.05	<5	<5	<10	<5	<20
SJ-226	<10	<10	277	<1	<1	<5	13.2	3,610	<10	<0.05	10.3	<5	<10	<5	<20
SJB-173	<10	<10	397	<1	<1	<5	<10	600	<10	<0.05	<5	<5	<10	BR	<20
ST-11516Z	<10	<10	74.2	<1	<1	<5	<10	594	<10	<0.05	<5	BR	<10	<5	<20
ST-5245Z	<10	<10	76.3	<1	<1	<5	<10	4,520	12.7	<0.05	<5	<5	<10	<5	<20

WELL NAME	Antimony ppb	Arsenic ppb	Barium ppb	Beryllium ppb	Cadmium ppb	Chromium ppb	Copper ppb	Iron ppb	Lead ppb	Mercury ppb	Nickel ppb	Selenium ppb	Silver ppb	Thallium ppb	Zinc ppb
Laboratory Detection Limits	10	10	1	1	1	5	10	20	10	0.05	5	5	10	5	20
TA-520	<10	<10	42.2	<1	<1	<5	40.8	<20	<10	<0.05	<5	<5	<10	BR	<20
WA-5295Z	<10	<10	69.8	<1	<1	<5	<10	<20	<10	<0.05	<5	<5	<10	<5	<20
WA-5311Z	<10	<10	17.8	<1	<1	<5	<10	<20	<10	<0.05	<5	<5	<10	BR	<20

* Denotes Duplicate Sample
BR = Data Rejected, Corresponding Analyte Found in Associated Method Blank

Table 12-5 Water Quality Statistics
Fiscal Year 2006

	PARAMETER	MINIMUM	MAXIMUM	AVERAGE
FIELD	Temperature (^{O}C)	19.37	28.12	22.40
	pH (SU)	4.96	9.35	7.16
	Specific Conductance (mmhos/cm)	0.029	2.31	0.54
	Salinity (ppt)	0.01	1.2	0.27
	TDS (g/L)	0.019	1.5	0.35
LABORATORY	Alkalinity (ppm)	<2	439	151.4
	Chloride (ppm)	2.6	671	104.1
	Color (PCU)	<5	130	18.5
	Specific Conductance (umhos/cm)	23.4	2,430	629.9
	Sulfate (ppm)	<1.25	31	2.93
	TDS (ppm)	27.3	1,302	372.3
	TSS (ppm)	<4	23	<4
	Turbidity (NTU)	<1	38	2.15
	Ammonia, as N (ppm)	<0.1	2.27	0.58
	Hardness (ppm)	<5	168	44.6
	Nitrate - Nitrite, as N (ppm)	<0.05	2.18	0.16
	TKN (ppm)	<0.1	2.41	0.67
	Total Phosphorous (ppm)	<0.05	0.62	0.21

Table 12-6 Inorganic Statistics
Fiscal Year 2006

PARAMETER	MINIMUM	MAXIMUM	AVERAGE
Antimony (ppb)	<10	<10	<10
Arsenic (ppb)	<10	<10	<10
Barium (ppb)	13.7	397	130.9
Beryllium (ppb)	<1	<1	<1
Cadmium (ppb)	<1	<1	<1
Chromium (ppb)	<5	<5	<5
Copper (ppb)	<10	46.4	<10
Iron (ppb)	<20	10,200	848.6
Lead (ppb)	<10	12.7	<10
Mercury (ppb)	<0.05	<0.05	<0.05
Nickel (ppb)	<5	10.3	<5
Selenium (ppb)	<5	30	<5
Silver (ppb)	<10	<10	<10
Thallium (ppb)	<5	50	<5
Zinc (ppb)	<20	296	21.3

Table 12-7 Three-year Water Quality Statistics

	PARAMETER	FY 1997 AVERAGE	FY 2000 AVERAGE	FY 2003 AVERAGE	FY 2006 AVERAGE
FIELD	Temperature (^{O}C)	21.17	21.90	21.86	22.40
	pH (SU)	7.09	7.23	7.16	7.16
	Specific Conductance (mmhos/cm)	0.618	0.692	0.669	0.54
	Field Salinity (ppt)	0.32	0.30	0.33	0.27
LABORATORY	Alkalinity (ppm)	160.8	165.8	157.7	151.4
	Chloride (ppm)	108.6	125.3	120.2	104.1
	Color (ppm)	18.0	21.8	18.0	18.5
	Specific Conductance (umhos/cm)	623.9	711.6	652.8	629.9
	Sulfate (ppm)	3.15	2.71	2.74	2.93
	TDS (ppm)	393.7	415.8	364.8	372.3
	TSS (ppm)	<4	<4	<4	<4
	Turbidity (NTU)	<1	2.30	1.92	2.15
	Ammonia, as N (ppm)	0.51	2.36	0.67	0.58
	Hardness (ppm)	46.5	49.1	46.2	44.6
	Nitrate - Nitrite, as N (ppm)	0.15	0.15	0.14	0.16
	TKN (ppm)	0.89	0.73	0.94	0.67
	Total Phosphorous (ppm)	0.21	0.22	0.14	0.21

Table 12-8 Three-year Inorganic Statistics

PARAMETER	FY 1997 AVERAGE	FY 2000 AVERAGE	FY 2003 AVERAGE	FY 2006 AVERAGE
Antimony (ppb)	5.30	<5	<5	<10
Arsenic (ppb)	<5	<5	<5	<10
Barium (ppb)	107.08	140.64	146.00	130.9
Beryllium (ppb)	<1	<1	<1	<1
Cadmium (ppb)	<1	<1	<1	<1
Chromium (ppb)	<5	<5	<5	<5
Copper (ppb)	19.63	10.82	15.39	<10
Iron (ppb)	230.02	370.89	641.32	848.6
Lead (ppb)	<10	<10	<10	<10
Mercury (ppb)	<0.05	0.06	<0.05	<0.05
Nickel (ppb)	<5	<5	<5	<5
Selenium (ppb)	<5	<5	<5	<5
Silver (ppb)	<1	<1	<1	<10
Thallium (ppb)	<5	<5	<5	<5
Zinc (ppb)	32.16	31.99	37.94	21.3

Table 12-9 List of VOC Analytical Parameters

BASELINE MONITORING PROGRAM
VOLATILE ORGANICS BY EPA METHOD 624

COMPOUND	DETECTION LIMIT (ppb)
1,1-DICHLOROETHANE	2
1,1-DICHLOROETHENE	2
1,1,1-TRICHLOROETHANE	2
1,1,2-TRICHLOROETHANE	2
1,1,2,2-TETRACHLOROETHANE	2
1,2-DICHLOROBENZENE	2
1,2-DICHLOROETHANE	2
1,2-DICHLOROPROPANE	2
1,3-DICHLOROBENZENE	2
1,4-DICHLOROBENZENE	2
BENZENE	2
BROMOFORM	2
CARBON TETRACHLORIDE	2
CHLOROBENZENE	2
DIBROMOCHLOROMETHANE	2
CHLOROETHANE	2
TRANS-1,2-DICHLOROETHENE	2
CIS-1,3-DICHLOROPROPENE	2
BROMODICHLOROMETHANE	2
METHYLENE CHLORIDE	2
ETHYLBENZENE	2
BROMOMETHANE	2
CHLOROMETHANE	2
METHYLENE CHLORIDE	2
O-XYLENE	2
STYRENE	2
METHYL-t-BUTYL ETHER	2
TETRACHLOROETHENE	2
TOLUENE	2
TRANS-1,3-DICHLOROPROPENE	2
TRICHLOROETHENE	2
TRICHLOROFLUOROMETHANE	2
CHLOROFORM	2
VINYL CHLORIDE	2

ppb = parts per billion

Table 12-10 List of Semivolatile Analytical Parameters
BASELINE MONITORING PROGRAM
SEMIVOLATILE ORGANICS BY EPA METHOD 625

COMPOUND	DETECTION LIMIT (ppb)
1,2-Dichlorobenzene	10
1,2,3-Trichlorobenzene	10
1,2,3,4-Tetrachlorobenzene	10
1,2,4-Trichlorobenzene	10
1,2,4,5-Tetrachlorobenzene	10
1,3-Dichlorobenzene	10
1,3,5-Trichlorobenzene	10
1,4-Dichlorobenzene	10
2-Chloronaphthalene	10
2-Chlorophenol	20
2-Methyl-4,6-dinitrophenol	20
2-Nitrophenol	20
2,4-Dichlorophenol	20
2,4-Dimethylphenol	20
2,4-Dinitrophenol	20
2,4-Dinitrotoluene	10
2,4,6-Trichlorophenol	20
2,6-Dinitrotoluene	10
3,3'-Dichlorobenzidine	10
4-Bromophenyl phenyl ether	10
4-Chloro-3-methylphenol	20
4-Chlorophenyl phenyl ether	10
4-Nitrophenol	20
Acenaphthene	10
Acenaphthylene	10
Anthracene	10
Benzidine	20
Benzo[a]pyrene	10
Benzo[k]fluoranthene	10
Benzo[a]anthracene	10
Benzo[b]fluoranthene	10
Benzo[g,h,i]perylene	10
Bis(2-chloroethoxy)methane	10
Bis(2-ethylhexyl)phthalate	10
Bis(2-chloroethyl)ether	10
Bis(2-chloroethyl)ether	10
Bis(2-chloroisopropyl)ether	10
Butylbenzylphthalate	10
Chrysene	10

Table 12-10 (Cont'd)
Semivolatile Parameters

COMPOUND	DETECTION LIMIT (ppb)
Dibenzo[a,h]anthracene	10
Diethylphthalate	10
Dimethylphthalate	10
Di-n-butylphthalate	10
Di-n-octylphthalate	10
Fluoranthene	10
Fluorene	10
Hexachlorobenzene	10
Hexachlorobutadiene	10
Hexachlorocyclopentadiene	10
Hexachloroethane	10
Indeno[1,2,3-cd]pyrene	10
Isophorone	10
Naphthalene	10
Nitrobenzene	10
N-Nitrosodimethylamine	10
N-Nitrosodiphenylamine	10
N-nitroso-di-n-propylamine	10
Pentachlorobenzene	10
Pentachlorophenol	20
Phenanthrene	10
Phenol	20
Pyrene	10

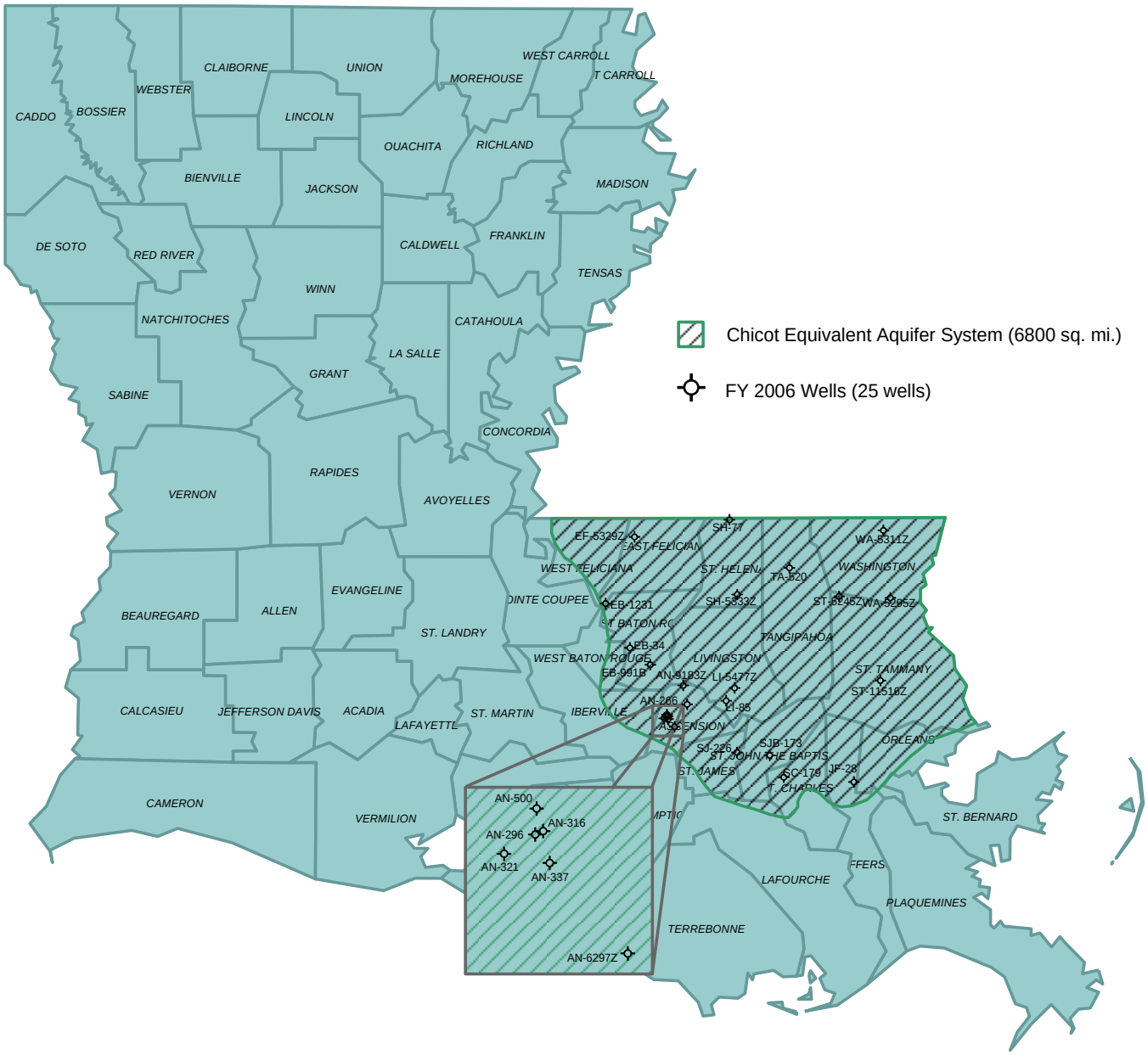
Table 12-11 List of Pesticide and PCB Analytical Parameters

BASELINE MONITORING PROGRAM

EPA METHOD 625

COMPOUND	DETECTION LIMIT (ppb)
4,4'-DDD	2
4,4'-DDE	2
4,4'-DDT	2
Aldrin	2
alpha-BHC	2
beta-BHC	2
delta-BHC	2
gamma-BHC (Lindane)	2
Chlordane	2
Dieldrin	2
Endosulfan I	2
Endosulfan II	2
Endosulfan sulfate	2
Endrin	2
Endrin aldehyde	2
Heptachlor	2
Heptachlor epoxide	2
Toxaphene	75
Aroclor-1016	10
Aroclor-1221	10
Aroclor-1232	10
Aroclor-1242	10
Aroclor-1248	10
Aroclor-1254	10
Aroclor-1260	10

BASELINE MONITORING PROGRAM WELLS OF THE CHICOT EQUIVALENT AQUIFER SYSTEM



Aquifer boundary digitized from Louisiana Hydrologic Map No. 2: Areal Extent of Freshwater in Major Aquifers of Louisiana. Smoot, 1988; USGS/LDOTD Report 86-4150

Figure 12-1 Location Plat, Chicot Equivalent Aquifer System

CHICOT EQUIVALENT AQUIFER SYSTEM - pH

Baseline Monitoring Program, FY 2006

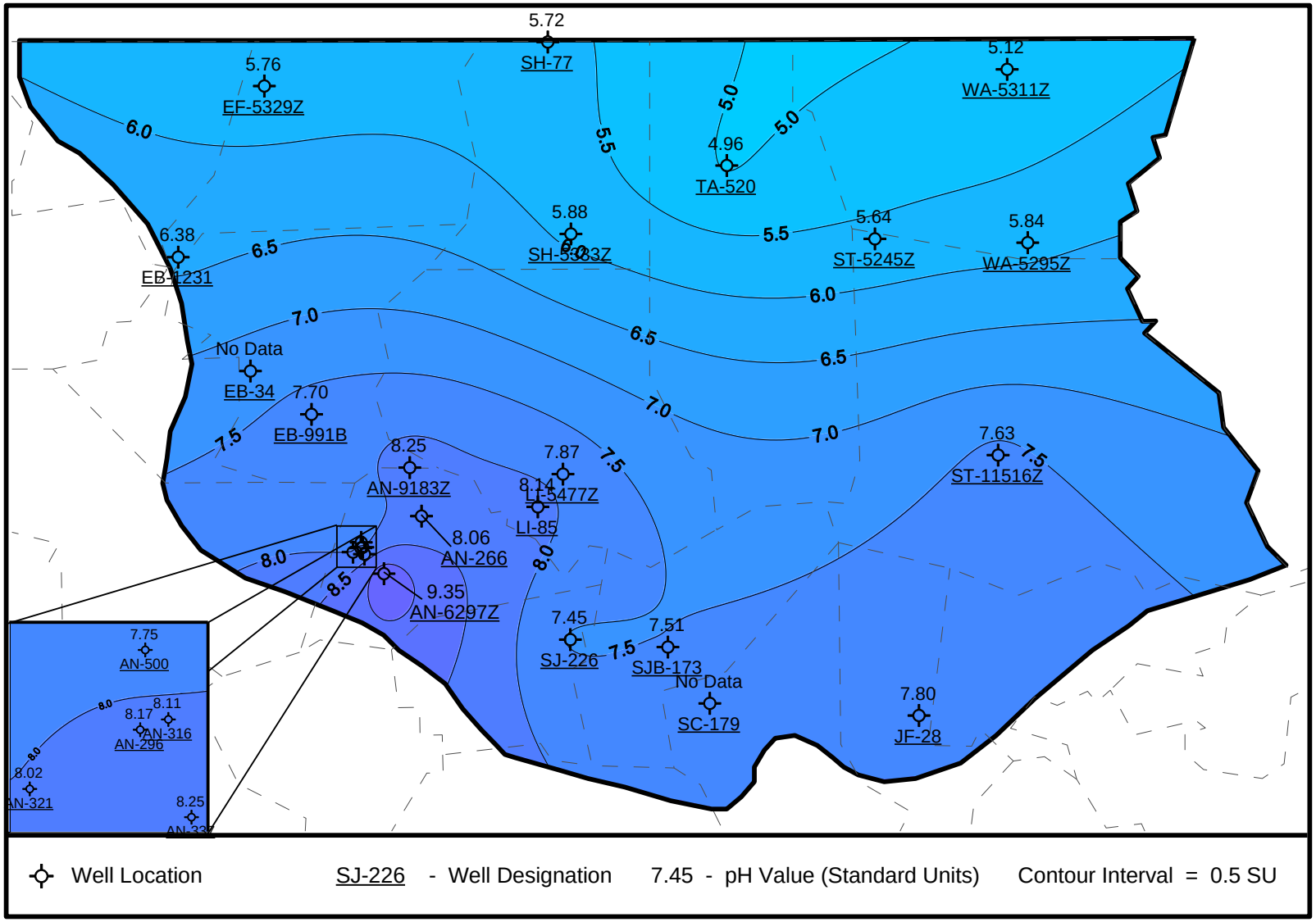


Figure 12-2 Map of pH Data

CHICOT EQUIVALENT AQUIFER SYSTEM - Total Dissolved Solids

Baseline Monitoring Program, FY 2006

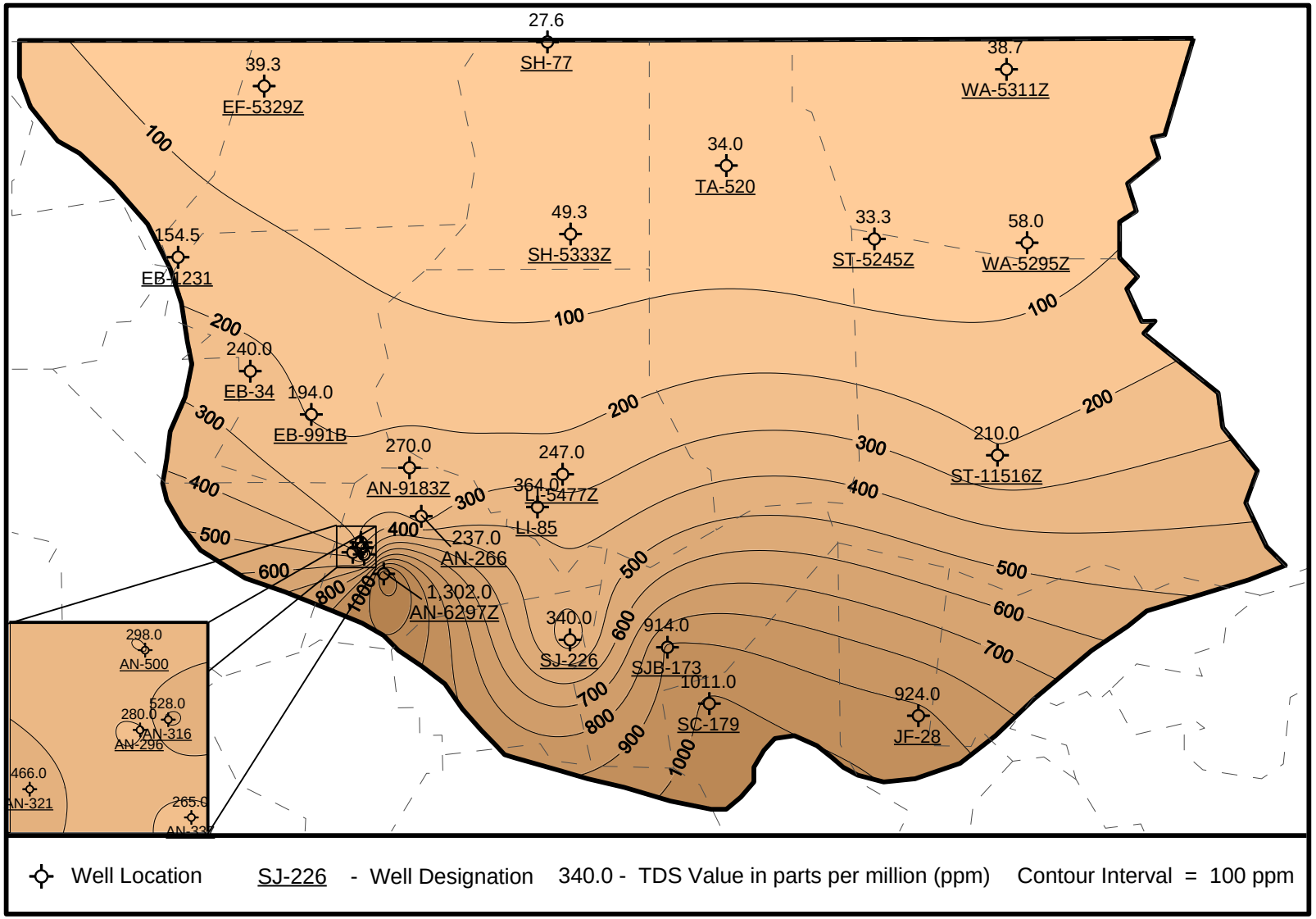


Figure 12-3 Map of TDS Data

CHICOT EQUIVALENT AQUIFER SYSTEM - Chloride

Baseline Monitoring Program, FY 2006

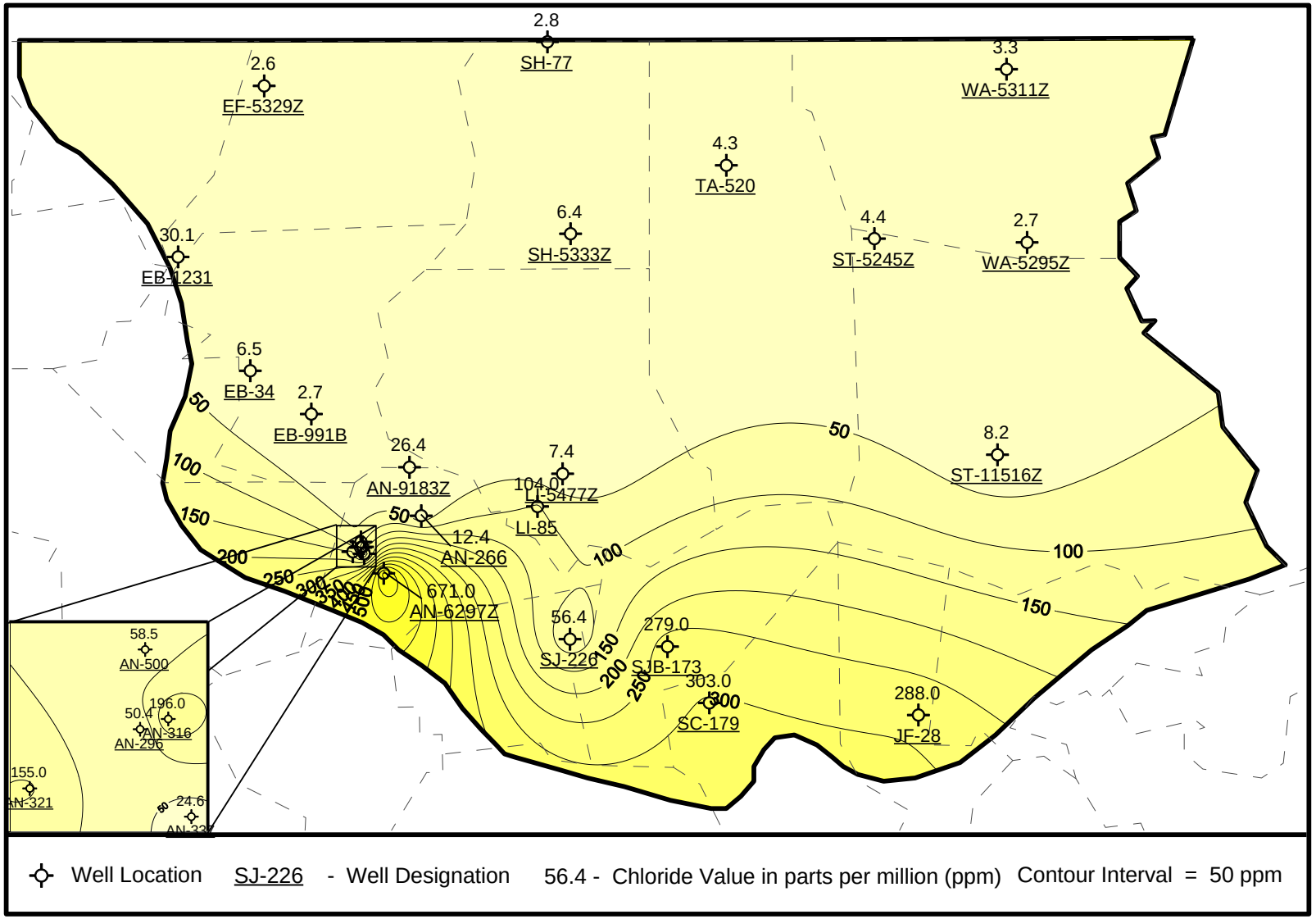


Figure 12-4 Map of Chloride Data

CHICOT EQUIVALENT AQUIFER SYSTEM - Iron

Baseline Monitoring Program, FY 2006

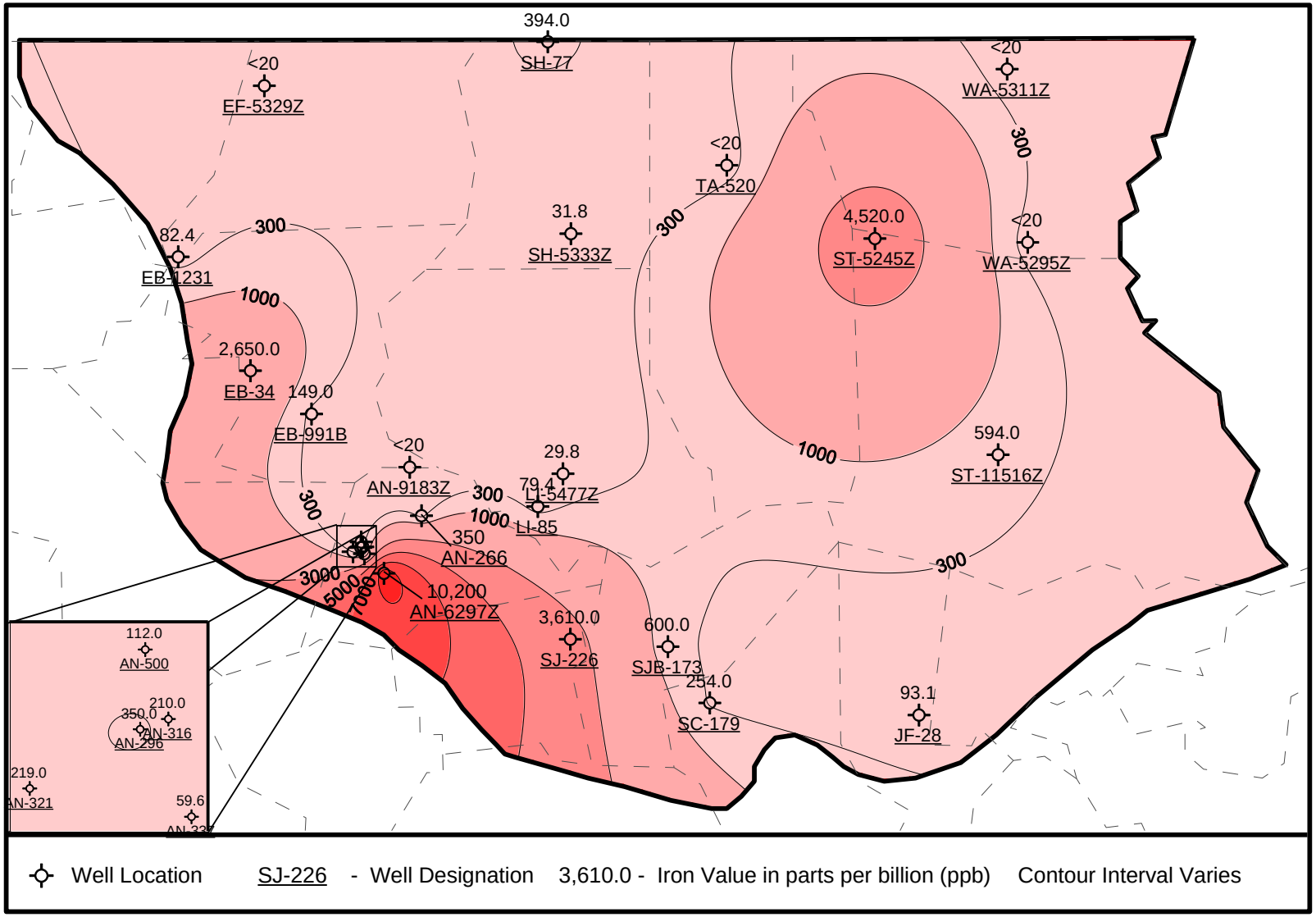


Figure 12-5 Map of Iron Data